Astronomy: Earth and Space Systems

8-4 The student will demonstrate an understanding of the characteristics, structure, and predictable motions of celestial bodies. (Earth Science)

8-4.3 Explain how the surface features of the Sun may affect Earth.
Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/future knowledge: In 1st grade (1-3.2), the Sun is recognized as the source of light and heat on Earth. In 4th grade (4-3.3, 4-3.4), students also explained the Sun's affects on Earth and relate heat and light to seasons.

It is essential for students to know that:

- The Sun's photosphere radiates light and heat from its surface and some of it reaches Earth.
- The corona sends out electrically charged particles, called *solar wind*. Most of these particles do not reach Earth's surface because of the atmosphere and the magnetic field around Earth.
- Near the poles, the *auroras* can form when these charged particles cause gases in the atmosphere to glow.
- Solar flares and prominences increase the particles in the solar wind that in turn affect magnetic storms in Earth's atmosphere.
- Magnetic storms often disrupt radio, telephone, and television signals.

It is not essential for students to know the entire spectrum of radiation that comes from the Sun, or the theories of the effects of sunspot activity on Earth's climate over time.

Assessment Guidelines:
The objective of this indicator is to *explain* how the surface features of the Sun may affect Earth; therefore, the primary focus of assessment should be to construct a cause-and-effect model of the various solar features on Earth. However, appropriate assessments should also require students to *infer* a solar feature based on a description of an event on Earth; or *recognize* terms that would identify a particular cause or effect.